WHAT IS CLAIMED IS:

1.   A sequence number checker, comprising:

     a bit map memory storing a first multiple level bit map representing a first sequence number of a first packet received by said sequence number checker; and

     a processor to compute a second multiple level bit map representing a second sequence number of a second packet received by said sequence number checker subsequent to said first packet, said second multiple level bit map being compared to said first multiple level bit map to produce a result indicating actions to be performed on said second packet.

2.   The sequence number checker according to claim 1, further comprising:

     a window controller to maintain a sliding window representing a range of sequence numbers; and

     a window memory storing a bottom value and a top value for said sliding window.

3.   The sequence number checker according to claim 2, wherein said range of sequence numbers is a fixed size.

4.   The sequence number checker according to claim 2, wherein said range of sequence numbers has a variable sized based upon characteristics of a security association.

5.   The sequence number checker according to claim 1, wherein said bit map

memory further comprises:

       a partition assigned to said security association.

6.   A method of maintaining a window of valid sequence numbers, comprising:

       determining characteristics of a security association; and

       setting a bottom value and a top value to define a window having a variable

size based on said characteristics of said security association.

       receiving a sequence number for a packet;

       comparing said sequence number to said window;

       setting a new top value equal to said sequence number if said sequence

number is greater than the said top value; and

       setting a new bottom value based on said new top value.

7.   A method for maintaining a window of valid sequence numbers, comprising:

setting a bottom value and a top value to define a window;

receiving a sequence number for a packet;

comparing said sequence number to said window;

setting at least one summary bit in a multiple level bitmap, to set a new top

value, if said sequence number is greater than said top value, wherein said at least one

summary bit indicates a validity of a contiguous range of bits within said multiple level

bitmap; and

setting a new bottom value based on said new top value.

8.   A method for checking sequence numbers, comprising:

receiving a sequence number for a packet;

converting said sequence number to a first multiple level bit map;

retrieving a second multiple level bit map stored in a bit map memory;

dividing said first multiple level bit map into a first plurality of summary bits;

dividing said second multiple level bit map into a second plurality of summary

bits; and

comparing said first and second plurality of summary bits to produce a result

indicating validity of said sequence number.

9.   The method according to claim 8, wherein said comparing step further

comprises:

setting a value for at least one of said second plurality of summary bits based

on said result; and

setting a range of contiguous bits in said second multiple level bit map based

on said result.

10.   The method according to claim 9, wherein setting said range of contiguous

bits in said second multiple level bit map comprises setting said range of contiguous bits to

a value of 0 when at least one of said second plurality of summary bits changes from a

value of 0 to a value of 1.

11.   The method according to claim 9, further comprising:

passing said packet upon producing a result indicating said sequence number

is valid.

12.   The method according to claim 9, further comprising:

discarding said packet upon producing a result indicating said sequence

number is invalid.

13.   An apparatus for maintaining a window of valid sequence numbers,

comprising:

means for setting a bottom value and a top value to define a window;

means for receiving a sequence number for a packet;

means for comparing said sequence number to said window;

means for setting at least one summary bit in a multiple level bitmap, to set a

new top value, if said sequence number is greater than said top value, wherein said at least

one summary bit indicates a validity of a contiguous range of bits within said multiple level

bitmap; and

means for setting a new bottom value based on said new top value.

14.   An apparatus for checking sequence numbers, comprising:

means for receiving a sequence number for a packet;

means for converting said sequence number to a first multiple level bit map;

means for retrieving a second multiple level bit map stored in a bit map

memory;

means for dividing said first multiple level bit map into a first plurality of

summary bits;

means for dividing said second multiple level bit map into a second plurality of

summary bits; and

means for comparing said first and second plurality of summary bits to

produce a result indicating validity of said sequence number.